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The Afterlife Is Expensive for Digital Movies

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Time was, a movie studio could pack up a picture and all of its assorted bloopers, alternate takes and other odds and ends as soon as the production staff was done with them, and ship them off to the salt mine. Literally.

Having figured out that really big money comes from reselling old films — on broadcast television, then cable, videocassettes, DVDs, and so on — companies like Warner Brothers and Paramount Pictures for decades have been tucking their 35-millimeter film masters and associated source material into archives, some of which are housed in a Kansas salt mine, or in limestone mines in Kansas and Pennsylvania.

A picture could sit for many, many years, cool and comfortable, until some enterprising executive decided that the time was ripe for, say, a Wallace Beery special collection timed to a 25th-anniversary 3-D rerelease of "Barton Fink," with a hitherto unseen, behind-the-scenes peek at the Coen brothers trying to explain a Hollywood in-joke to John Turturro. It was a file-and-forget system that didn't cost much, and made up for the self-destructive sins of an industry that discarded its earliest works or allowed films on old flammable stock to degrade. (Indeed, only half of the feature films shot before 1950 survive.)

But then came digital. And suddenly the film industry is wrestling again with the possibility that its most precious assets, the pictures, aren't as durable as they used to be. The problem became public, but just barely, last month, when the science and technology council of the Academy of Motion Picture Arts and Sciences released the results of a yearlong study of digital archiving in the movie business. Titled "The Digital Dilemma," the council's report surfaced just as Hollywood's writers began their walkout. Busy walking, or dodging, the picket lines, industry types largely missed the report's startling bottom line: To store a digital master record of a movie costs about \$12,514 a year, versus the \$1,059 it costs to keep a conventional film master.

Much worse, to keep the enormous swarm of data produced when a picture is "born digital" — that is, produced using all-electronic processes, rather than relying wholly or partially on film — pushes the cost of preservation to \$208,569 a year, vastly higher than the \$486 it costs to toss the equivalent camera negatives, audio recordings, on-set photographs and annotated scripts of an all-film production into the cold-storage vault. All of this may seem counterintuitive. After all, digital magic is supposed to make information of all kinds more available, not less. But ubiquity, it turns out, is not the same as permanence.

In a telephone interview earlier this month, Milton Shefter, a longtime film preservationist who helped prepare the academy's report, said the problems associated with digital movie storage, if not addressed, could point the industry "back to the early days, when they showed a picture for a week or two, and it was thrown away."

Mr. Shefter and his associates do not contend that films are actually on the verge of becoming quite that ephemeral. But they do see difficulties and trends that could point many movies or the source material associated with them toward “digital extinction” over a relatively short span of years, unless something changes.

At present, a copy of virtually all studio movies — even those like “Click” or “Miami Vice” that are shot using digital processes — is being stored in film format, protecting the finished product for 100 years or more. For film aficionados, the current practice is already less than perfect. Regardless of how they are shot, most pictures are edited digitally, and then a digital master is transferred to film, which can result in an image of lower quality than a pure film process — and this is what becomes stored for the ages.

But over the next couple of decades, archivists reason, the conversion of theaters to digital projection will sharply reduce the overall demand for film, eventually making it a sunset market for the main manufacturers, Kodak, Fujifilm and Agfa. At that point, pure digital storage will become the norm, bringing with it a whole set of problems that never troubled film.

To begin with, the hardware and storage media — magnetic tapes, disks, whatever — on which a film is encoded are much less enduring than good old film. If not operated occasionally, a hard drive will freeze up in as little as two years. Similarly, DVDs tend to degrade: according to the report, only half of a collection of disks can be expected to last for 15 years, not a reassuring prospect to those who think about centuries. Digital audiotape, it was discovered, tends to hit a “brick wall” when it degrades. While conventional tape becomes scratchy, the digital variety becomes unreadable.

Difficulties of that sort are compounded by constant change in technology. As one generation of digital magic replaces the next, archived materials must be repeatedly “migrated” to the new format, or risk becoming unreadable. Thus, NASA scientists found in 1999 that they were unable to read digital data saved from a Viking space probe in 1975; the format had long been obsolete.

All of that makes digital archiving a dynamic rather than static process, and one that costs far more than studios have been accustomed to paying in the past — no small matter, given that movie companies rely on their libraries for about one-third of their \$36 billion in annual revenue, according to a recent assessment by the research service Global Media Intelligence.

“It’s been in the air since we started talking about doing things digitally,” Chris Cookson, president of Warner’s technical operations and chief technology officer, said of the archiving quandary.

One of the most perplexing realities of a digital production like “Superman Returns” is that it sometimes generates more storable material than conventional film, creating new questions about what to save. Such pile-ups can occur, for instance, when a director or cinematographer who no longer has to husband film stock simply allows cameras to remain running for long stretches while working out scenes.

Much of the resulting data may be no more worth saving than the misspellings and awkward phrases deleted from a newspaper reporter’s word-processing screen. Then again, a telling exchange between star and filmmaker might yield gold as a “special

feature" on some future home-viewing format — so who wants to be responsible for tossing it into the digital dustbin?

For now, studios are saving as much of this digital ephemera as possible, storing it on tapes or drives in vaults not unlike those that house traditional film. But how much of that material will be migrated when technology shifts in 7 or 10 years is anyone's guess. (And archiving practices in the independent film world run the gamut, from studied preservation to complete inattention, noted Andrew Maltz, director of the academy's science and technology council.)

According to Mr. Shefter, a universal standard for storage technology would go far toward reducing a problem that would otherwise grow every time the geniuses who create digital hardware come up with something a little better than their last bit of wizardry. As the report put it, "If we allow technological obsolescence to repeat itself, we are tied either to continuously increasing costs — or worse — the failure to save important assets."

In other words, we could be watching Wallace Beery long after more contemporary images are gone.